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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* LOUIS J. WARDLAW III

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Appeal 2009-002799  
Application 10/600,921  
Technology Center 2800

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Decided: August 25, 2009

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Before ALLEN R. MACDONALD, *Vice Chief Administrative Patent Judge*,  
and CHUNG K. PAK, and TERRY J. OWENS, *Administrative Patent  
Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1 through 8, all of the claims pending in the above-identified application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

The subject matter on appeal relates to a method and a system for "testing the integrity of welds" (Spec. 4, ll. 2-4 and claims 1 and 5). Details

of the appealed subject matter are recited in representative claims 1, 4, and 5 reproduced below<sup>1</sup>:

1. A method of detecting flaws in a weld connecting a wellhead to a casing, the method comprising the steps of:

(a) connecting a source of pressurized gas composition to an injection port in the wellhead in fluid communication with the weld, said pressurized gas composition comprising a gas mixture including a marker sub-composition comprising at least a marking amount of a non chlorine-containing hydrocarbon;

(b) injecting said pressurized gas composition including said hydrocarbon through said injection port while the weld is at an elevated temperature;

(c) monitoring the source of pressurized gas composition for detecting losses in pressure; and

(d) passing a non chlorine-containing hydrocarbon gas detector probe over the weld for detecting non chlorine-containing hydrocarbon gas leaking through the weld.

4. The method of claim 1 wherein fluid communication is established between said pressurized gas composition and the weld while the temperature of the wellhead is at substantially 500[.]degree[.] F.

5. A system for determining flaws in a weld connecting a terminal flange to a pipe, comprising:

(a) a source of pressurized gas composition for connection to a wellhead injection port establishing fluid communication between said source of pressurized gas composition and said weld;

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<sup>1</sup> Pursuant to 37 C.F.R. § 41.37(c)(1)(vii) (2007), we limit our discussion to claims 1, 4, and 5.

(b) a gas detector probe for detecting a non chlorine-containing hydrocarbon gas leaking through said weld; and

(c) wherein fluid communication is established between said pressurized gas composition and said weld while the weld is maintained at an elevated welding temperature for detecting flaws in said weld at said elevated temperature.

The Examiner relied upon the following prior art references as evidence of unpatentability (Ans. 3)

Wardlaw	US 4,596,135	Jun. 24, 1986
Henry	US Re. 35,395	Dec. 10, 1996

The Examiner rejected claims 1 through 8 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Wardlaw and Henry.

Appellant traverses the Examiner's § 103(a) rejection, arguing that one of ordinary skill in the art would not have had any reason to employ the claimed non-chlorine containing hydrocarbon as a marker sub-composition in Wardlaw's method and system for detecting flaws in the weld connecting a wellhead to a casing (App. Br. 8-9). In support of this argument, Appellant attacks the disclosure of Henry as being directed to a non-analogous art, a leak detecting gas containing a lubricant detrimental to welds and welding procedures, and a leak detecting method and system applicable to a cold system (*id.*).

### ISSUE AND CONCLUSION

The dispositive question raised in this case is: (1) Has Appellant identified reversible error in the Examiner's determination that one of ordinary skill in the art would have been led to employ the claimed non-chlorine containing hydrocarbon as a marker sub-composition in Wardlaw's

method and system for detecting flaws in the weld connecting a wellhead to a casing within the meaning of 35 U.S.C. § 103? On this record, we answer this question in the negative.

### RELEVANT FINDINGS OF FACT

1. Appellant does not dispute the Examiner's finding that:

Wardlaw teaches a method of detecting flaws in a weld, comprising: connecting a source 40 of pressurized gas composition to an injection port 28 in a wellhead 10 in fluid communication with the weld 22,24, said composition comprising a gas mixture including a marker sub-composition comprising *a hydrocarbon* (Col. 3, lines 60-66); injecting said-pressurized gas composition through the injection port while the weld is at an elevated temperature (Col. 4, lines 10-16); monitoring the source of pressurized gas composition for detecting losses in pressure (Col. 4, lines 16-18); and passing a marker gas detector probe 50 over the weld for detecting the marker gas leaking through the weld (Col. 4, lines 21-24). [(Emphasis added.)] [(Compare Ans. 3 with App. Br. 8-10)]

2. Appellant does not dispute the Examiner's finding that:

Wardlaw teaches a system for detecting flaws in a weld, comprising: a source 40 of pressurized gas composition for connection to a wellhead injection port 28 establishing fluid communication between the source of pressurized gas composition and the weld 22,24; a gas detector probe 50 for detecting *a hydrocarbon gas* leaking through the weld; and wherein fluid communication is established between the pressurized gas composition and the weld while the weld is

maintained at an elevated temperature for detecting flaws in the weld at the elevated temperature (Col. 4, lines 10-15). [(Emphasis added.)][(Compare Ans. 4 with App. Br. 8-10.)]

3. Wardlaw illustrate the system for detecting flaws in the weld connecting a wellhead to a casing in its Figures 1 and 2 which are identical to the system illustrated in Figures 1 and 2 of the above-identified application. (*Compare* Wardlaw, Figs. 1 and 2 *with* Figs. 1 and 2 of the subject application.)
4. Appellant does not dispute the Examiner finding that

Wardlaw teaches fluid communication being established between the pressurized gas composition and the weld while the temperature of the wellhead is at substantially 500 degrees F (Col. 3, lines 22-23; Col. 4, lines 10-13). [(*Compare* Ans. 4 *with* App. Br. 8-10.)]

5. Wardlaw teaches (col. 3, l. 55 to col. 4, l. 31) (emphasis added) that:

The pressurized container 40 contains a mixture of gases. The gas mixture provides sufficient press...to test for any flaws or cracks which may be present in the weld beads 22 and 24. The gas mixture also includes a marker gas which may be easily detected as it leaks through the welds 22 and 24. By way of example and for illustrative purposes only, compressed nitrogen may be used to supply the pressure necessary for testing the integrity of the welds 22 and 24. *A halo-carbon [i.e., halogenated carbon] or hydrocarbon gas, which is easily detectable at very low concentrations, may be utilized as the marker gas in the pressurized gas mixture of the system of the*

*present disclosure.* It is understood, however, that other gases may also be used to form the gas mixture...

...The detecting apparatus is calibrated to register very small concentrations of the marker gas, even in the range of parts per billion. Thus, the system of the present disclosure provides an effective means for locating flaws in the weld beads 22 and 24 at an elevated temperature substantially near the welding temperature.

6. Henry is directed to “leak detection in *heating*, ventilating and air conditioning systems using an *environmentally safe material*” (col. 1, ll. 1-18 and the title of the patent at the cover page) (emphasis added).
7. Henry, like Appellant, explains that Freon® (a chlorinated hydrocarbon) is known to deplete the ozone layer in the atmosphere. (*Compare* Henry, col. 1, ll. 20-22, *with* Spec. 6, ll. 3-8).
8. Henry, like Appellant, explains the need to employ a non-chlorinated hydrocarbon that will not be detrimental to the environment in a leak detection system. (*Compare* Henry, col. 1, ll. 20-30 with Spec. 6, ll. 3-17).
9. Appellant also acknowledges at page 6, lines 5-7 of the Specification that it was well known that:

Freon and other chlorine-containing halogenic gaseous substances have been prohibited as refrigerants and other commercialized uses by many nations in the world because of the belief that it destroys [sic., they destroy] the protective ozone belt in the atmosphere.

## PRINCIPLES OF LAW

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

As stated in *KSR Int'l Co., v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007):

“[A]nalysis [of whether the subject matter of a claim would have been prima facie obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”

*See also In re Hoeschele*, 406 F.2d 1403, 1406-407 (CCPA1969) (“[I]t is proper to take into account not only specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw therefrom . . .”). As explained in *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006):

The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.

The common knowledge attributable to one of ordinary skill in the art includes what was admittedly known in the art by Appellant at the time of the invention. *See In re Nomiya*, 509 F.2d 566, 570-71 (CCPA 1975) (The admitted prior art in applicant’s Specification may be used in determining



the patentability of a claimed invention.); *see also In re Davis*, 305 F.2d 501, 503 (CCPA 1962).

## ANALYSIS

As indicated *supra*, Wardlaw teaches the claimed method and system for detecting flaws in the weld connecting a wellhead to a casing at the claimed elevated temperature, except that its hydrocarbon gas marker is not specifically mentioned to be non-chlorinated. However, Wardlaw teaches (col. 3, l. 65 to col. 4, l. 31) (emphasis added) that:

*A halo-carbon [i.e., halogenated carbon] or hydrocarbon gas, which is easily detectable at very low concentrations, may be utilized as the marker gas in the pressurized gas mixture of the system of the present disclosure. It is understood, however, that other gases may also be used to form the gas mixture...*

*...The detecting apparatus is calibrated to register very small concentrations of the marker gas, even in the range of parts per billion. Thus, the system of the present disclosure provides an effective means for locating flaws in the weld beads 22 and 24 at an elevated temperature substantially near the welding temperature.*

Implicit in this teaching is that both chlorinated and non-chlorinated hydrocarbon marker (a hydrocarbon or a non-chlorine containing halogenated hydrocarbon) and their detection probes can be used for detecting flaws in a weld connecting a wellhead to a casing at the claimed elevated temperature.<sup>2</sup> As explained by Henry and acknowledged by

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<sup>2</sup> Since the term “a halo-carbon” is inclusive of all halogenated hydrocarbons, e.g., chlorinated or fluorinated (non-chlorinated) hydrocarbons, it can be inferred from the subsequent term “hydrocarbon gas” that the hydrocarbon is not halogenated. There is nothing in Wardlaw, which indicates or teaches that its hydrocarbon gas is chlorinated.

Appellant, however, the use of the chlorinated hydrocarbons is known to be undesirable as they are known to damage our environment via depleting the ozone layer in the atmosphere.

Given the above teachings, we determine that one of ordinary skill in the art would have been led to employ the claimed non-chlorinated hydrocarbon gas marker and its associated probe suggested by Wardlaw and Henry, in the weld flaw detecting method and system taught by Wardlaw within the meaning of 35 U.S.C. § 103. *See also Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (The disclosure in a prior art reference of a multitude of effective formulations does not render any particular formulation less obvious, particularly when the claimed formulation is used for the identical purpose taught by the prior art reference.)

Appellant contends that Henry is from a nonanalogous art and is, therefore, uncombinable. However, as correctly explained by the Examiner at page 5 of the Answer, both Henry and Appellant disclose solving the problems associated with detecting leaks. In fact, Henry's and Appellant's inventions are directed to overcoming the same problem associated with using a gas detrimental to the environment in detecting leaks. Thus, we concur with the Examiner that Henry, which is reasonably pertinent to the particular problem with which the inventors were involved, is deemed to be from an analogous art. *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979) (A reference is from an analogous art if it is reasonably pertinent to the particular problem with which the inventor was involved.); *see also KSR*, 550 U.S. at 417-18 ("When a work is available in one field of endeavor,

design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.”).

Appellant attacks Henry only to show that there is no suggestion to employ the claimed non-chlorinated hydrocarbon gas marker in the method and system taught by Wardlaw. In so doing, Appellant ignores the longstanding legal principle that the obviousness test under § 103 is not what the prior art references individually teach, but what their combined teachings would have fairly suggested to a person of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). As indicated *supra*, the collective teachings of both Wardlaw and Henry would have suggested the claimed subject matter within the meaning of 35 U.S.C. § 103(a).

Thus, based on the record, including due consideration of Appellant’s arguments in the Appeal Brief, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103(a).

#### DECISION

In view of the foregoing, the decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F. R. § 1.136(a).

AFFIRMED

Appeal 2009-002799  
Application 10/600,921

PL Initial:  
sld

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